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Hay Production Cost Increases in 2022 and Management Implications

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Costs for hay production have skyrocketed in 2022. Fertilizer is driving the bulk of the overall increase, followed by fuel, and then general cost increases for other categories (what could be considered “general inflation”). While we can debate the exact causes of all these increases (i.e. “Policy Blunder” or “Putin’s War”), we have a serious situation that needs to be understood and dealt with.

See Table 1 for changes in fertilizer prices between 2021 and 2022. Assuming we are using 60 units of N, 30 units of P, and 100 units K per acre, our total fertilizer cost bill would have gone from \$67 to \$150/acre, or an increase of \$73/acre. This is about a \$24/ton increase at 3 tons/acre hay production.

Table 1: Fertilizer Price Increases 2022

Fertilizer	Spring 2021		Spring 2022	
	\$/ton	\$/unit	\$/ton	\$/unit
Urea (N)	\$370	\$0.40	\$920	\$1.00
DAP (P ₂ O ₅)	\$515	\$0.40	\$860	\$0.54
Potash (K ₂ O)	\$370	\$0.31	\$815	\$0.68

I will be the first to acknowledge that not all of this fertilizer cost increase will be fully realized as most farmers are cutting way back on fertilizer applications this year. That of course will mean lower yields on average, but the “true” cost will be somewhat less than the \$24/ton shown in Table 1. Using very rough calculations, I would put that figure somewhere between \$15-20/ton effective increase for fertilizer cost.

Note that it is actually possible that some farmers' fertilizer costs went down in 2022. This could have occurred if they are typically reliant on commercial fertilizer but applied very low levels in 2022. However, if fertilizer is actually a benefit to them in most years then either their yields will have gone down in 2022 or they are mining their P and K nutrient bank, which will have to be replenished in future years.

Fuel costs have also increased dramatically. During the spring of 2021 on-farm diesel was in the \$2.10-2.25/gallon range. In 2022 it increased dramatically to \$4.70/gallon in May and peaked over \$5/gallon in late June and early July. Currently, in late July it has fallen back down below \$5/gallon. Assuming 5 gallons of diesel fuel per acre over two cuttings and moving the hay to storage, with an average price increase of \$2.75/gallon would result in an overall fuel cost increase of \$13.75 per acre, or roughly \$4.50/ton.

If we assume all other costs (supplies, repairs, equipment depreciation/interest, rent, labor, etc.) increased at roughly the general inflation rate of 9%, that would give us an additional cost increase of \$3.50/ton.

Thus our total cost increase for making hay between 2021 and 2022 would be in the range of \$23-28/ton. For a 5'x5' bale this would be roughly \$12-15 per bale. For a 4'x5' bale this would be roughly \$9-11 per bale. So far this year, I have not seen anything close to this level of increase in hay prices in Kentucky. However, unless 1) these costs come down substantially over the next 1-2 years, or 2) hay producers learn how to get good yields without commercial fertilizer, hay prices will have to increase.

Management Implications

Fertilizer cost increases are over twice all the other increases combined. While the record diesel fuel prices in 2022 are getting a lot of the headline news, the overall cost increase levels are nowhere near those of fertilizer prices on a per acre basis as was previously discussed. Moreover, there is only so much you can do to reduce your fuel costs if you are going to continue to make hay unless you are willing to trade in your 80 HP air-conditioned cab tractor for original horsepower that runs on solar energy (i.e. pasture, hay, and grain). *Aside note: one of the most efficient hay operations I have ever seen was primarily horse-powered, with both a square and round baler powered by a satellite engine. It was amazing how much hay they put up each year and I suspect embarrassed quite a few conventional hay producers in the area.*

On the other hand, there are a number of practical options for hay producers and cattle farmers to reduce their dependence on commercial fertilizer. Nitrogen, in particular, can be replaced by learning how to manage legumes in mixed grass stands or even as pure specialty stands. A half-century ago, annual lespedeza was the forage of choice for dairy production in many parts of Kentucky. Dorris Bruce who now has beef cattle west of Lawrenceburg said they planted pure stands for their dairy in Muhlenberg County where he grew up, and that cut in the proper stage would produce more milk than any other forage they could grow. It is also my personal favorite forage for finishing beef cattle on. There are other biological and hay feeding techniques that can be used to reduce or eliminate the need for commercial fertilizer, P and K included. Check out a previous article, "[Reducing Your Dependency on Commercial Fertilizers Strategies for Cattle Farm in 2022 and Beyond.](#)"

Another option to reduce dependency on commercial fertilizer is to position your farm so it is less reliant on hay. Cow-calf farms that have on average been feeding 130-150 days of hay per year will need to either radically change management or cull their herd so that they can get down to the 60-90 days hay feeding range if they want to have a chance to be profitable. This level of hay feeding is the

most profitable level given a realistic range of foreseeable hay price and calf price scenarios. For details of this analysis see the article in Hay and Forage Grower, "[Find the Hay-Feeding Days Sweet Spot.](#)"

Unless fertilizer prices decrease quickly and dramatically over the next 1-2 years, we will be in a new era for hay production costs. Those farmers that don't quickly adapt to this change in cost structure are going to have a hard time surviving. Those farmers that have already learned, or are willing to learn, to use legumes and other biological techniques for the bulk of their fertility needs will gain a substantial competitive advantage. Collectively cattle farmers have been way too dependent on commercial fertilizer in the last few decades. Many have voluntarily moved away from commercial fertilizer and embraced these biological techniques in the last few years. However, a majority are still trading away profits for purchased fertility and are addicted to the quick fix it gives its user. Sometimes a kick in the butt (i.e. the high \$ figure on the fertilizer bill) is needed to provide the incentive to make a change. The only uncertainties are 1) how hard will the kick need to be? And 2) how many times will they need to receive it? I'm betting most Kentucky farmers are fast learners when properly motivated.

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